Executive Summary

The aim of the Television Broadband Exchange (TBE) is to provide broadband wireless services to Local Community Anchors via local television stations' excess digital spectrum utilizing a cellular network architecture and technology. Television Broadband Exchange Program Overview 1. Use available Local TV spectrum to deliver broadband services including over the air video channels to LCAs as well as to emergency service providers, minorities, elderly, low income households and other unserved or underserved groups, at a lower cost per service point. 2. Utilize a combination of private capital, tax benefits and government grants to fund the TBE; 3. The TBE is a not for profit entity that will offer and maintain low rates for Qualifying Customers (LCAs, emergency service providers, minorities, elderly, low income households and other unserved or underserved qualified groups). Non-Qualifying Customers will pay a market rate for the service. 4. The initial funding would be based on a contribution of $5,000,000 (35.05 %) in kind local television spectrum and $9,265,000 in governmental grants (64.95 %). In addition, the Kaleidoscope Foundation will solicit addition private funds to assist in keeping the monthly rates low. 5. The TBE will initially focus and provide service for the Fayetteville-Ft. Smith Designated Market Area ('DMA') including the spill-over coverage into Eastern Oklahoma. The TBE currently has the spectrum from 11 Local Television stations committed to the program. 6. Each Local TV station will commit approximate 16 megabits of their digital capacity to TBE. The remaining capacity will allow the Local TV station to broadcast a single standard definition channel of free over the air video to viewers in their broadcast area in compliance with their Federal Communications Commission mandate. This arrangement has an additional benefit in that it will minimize the Local TV stations on-going operational expenses. This will allow more Local TV stations, many of which are owned by minorities or show Hispanic programming, to survive in this tough economic market. 7. This project should generate a minimum of 40 jobs from Phase 1, 40 additional jobs in Phases 2 & 3, and 20 jobs at the local TV operation. This equates to 210 job years over the first three years of operations. This results in a cost of $44,119 per job year based on the $9,265,000 grant request. 8. For the commercial broadband operations, the TBE will utilize any innovative and successful last mile service provider to deliver two-way broadband data, voice and video data streams to local business and residential customers. One of these providers is Cellular Terrestrial Broadcasting ('CTB'). The delivery of broadband services to unserved or underserved areas is generally believed to be more expensive for three main reasons: distance, remoteness and scale economies. Distance: Dwellings and businesses are normally far away from the point of supply of a utility service. The point of supply, or point of presence ('POP'), is typically a local exchange facility, a local telecommunications provider ('Telco') or LCA. Many solutions and especially the cheapest operate only up to modest distances. This limited availability of broadband
further impedes economic development and job creation for these unserved or underserved communities. Remoteness: Delivery of continuous (24x7) broadband services in a triple-play environment of voice, video and data depends not only on the broadband access network, the so-called 'last mile', but also on a means of connection from the local POP to the mainline or high-capacity backbone networks. While backbone networks provide plentiful high bandwidths cheaply, they are only cheap when their capacity is filled. Such networks, naturally serve high density suburbs and cities. The more remote communities must bear extra costs for distant connection between the local point of presence and a backbone network. This linkage to a main network node is known as backhaul or the 'middle mile'. The cost of backhaul increases with remoteness, but is small or minimal in the urban environment. Scale Economies: Most broadband technologies frequently depend on operating systems having high basic costs but a capability to serve many connections. There is thus often a scale economy that cannot be realized in unserved or underserved areas, raising unit costs. Technology can play a major role here, since it may succeed over time in reducing the minimum operational size of an operating system. This shifts the scale economy, making the technology available to a wider customer base. Distance- Additional Considerations Typical broadcast channels send megabits or tens of megabits per second in a shared and unidirectional mode from the transmitting tower to the community anchor nodes. Bi-directional operation is typically achieved through a subsystem of Local Community Anchors. The LCA node has two main purposes. The first is to receive the broadcast signal, for example from our central broadcast transmitting tower, and distribute it to the end users/citizens within the vicinity of LCA and second, act as a POP. This flexibility allows the end users within the vicinity of the LCA to access our network via a secondary access medium such as cellular communications for the return path. Our solution is essentially a hybrid solution using a secondary access solution and the primary broadcast medium to provide linkage to the mainline or high-capacity core Internet backbone. Remoteness- Additional Considerations In unserved and underserved areas that are far away from a core backbone network (e.g. fiber) access to triple play services and continuous (24x7) connectivity cannot be performed, unless extension of the core backbone to these regions is accomplished. For such regions, our hybrid solution using a local secondary access solution and the primary broadcast medium leverages our large broadcast area (30-50 km). Our proposed architecture is a very promising solution, enabling triple play services and continuous connectivity (24x7) via cost-effective extension of the core backbone. Scale Economies ' Additional Considerations We can achieve economy of scale with the prescribed two years timely completion period. By leveraging our existing Local TV central broadcast transmitting tower/facility, our spectrum and currently available Local TV Internet Protocol ('IP') point-to-point equipment, TBE can economically connect hundreds of rural community anchors within our broadcast area. An Example The following is a brief description of how the TBE would utilize and integrate its approach to address the three main issues for the delivery of broadband services to unserved and underserved LCAs. In the Fayetteville-Ft Smith DMA, TBE currently has the spectrum from 11 Local TV stations. The following will describe how the TBE intends to utilize the Local TV spectrum for the delivery of up to 16Mbps of broadband services to LCAs from one central broadcast transmitting tower. In an area where there are overlaps in signal coverage, we can provide more than 16Mbps of bandwidth. The list of all 11 central broadcast transmitting towers is found in the upload section Network Maps (Kaleidoscope_1.pdf). The TBE consists of two subsystems: a) A central broadcasting transmitting tower b) A number of LCAs located within our broadcasting area. Within our broadcast area two types of
services are available: a) One way TV, digital broadcasting such as Internet Protocol Television (IPTV) data-cast, push multicast and private off line datacasting. b) All IP traffic such as interactive TV, interactive broadcasting, and Internet. Even LCAs located in unserved and underserved areas, can easily and cost-effectively access our network by utilizing a simple UHF reception antenna and the corresponding IP reception equipment at their own premises. Secondly, the exploitation of the common TV program and IP traffic stream in the middle-mile configurations, allows for the fast and immediate interconnection between the core backbone and any LCA within the entire broadcasting footprint. The communication between the end users/citizens and the corresponding LCA is achieved via secondary broadband point-to-multipoint links. The LCAs act as a gathering point for all IP traffic stemming from its own users and forwards it to the central broadcasting tower via dedicated Local TV IP point-to-point uplink.